

New Jersey Department of Transportation
Bureau of Research
RESEARCH PROJECT
Request for Proposals
2012 Program

Date of RFP
11/2/2011

Closing Date
12/15/2011

Feasibility of Lane Closures Using Probe Data
Project No. 2012-05

(Proposals must be prepared in accordance with NJDOT's *Information and Instructions for Preparing Proposals*. Please visit:

<http://www.state.nj.us/transportation/refdata/research/pdf/techpropresproj.pdf>

Revised Proposal Evaluation Forms are available for your information on the website.)

Proposals will be based on the merit of the information contained in the proposal. Budgets will be evaluated separately. Please place three (3) copies of the budget for this project in a separate sealed envelope.

1. RESEARCH PROBLEM STATEMENT, BACKGROUND AND OBJECTIVES

Lane closures, necessitated by major roadway construction, can cause traffic bottlenecks and congestion. Roadway congestion results in lost time and resources for travelers. To date, the structure of traffic has mainly been measured with point detectors, which are limited in their scope. A method for the reconstruction of spatiotemporal traffic dynamics from probe data is suggested with the aim of overcoming the limitations of point detectors.

Probe data collection is a set of relatively low-cost methods for obtaining travel time and speed data for vehicles traveling along roadway segments. Probe data technology provides advantages over other methods of traffic measurement:

- Less expensive than sensors or cameras
- More coverage (potentially including all locations and streets)
- Faster to set up and less maintenance
- Works in all weather conditions, including heavy rain

This project's main objective is to determine the most economical method to collect probe data and then to utilize this probe data to determine expanded and/or contracted lane closure hours for major construction projects. A cost benefit analysis will be included to measure the savings of using real-time traffic probe data versus existing traffic management approaches based on volume and capacity in the planning, design and implementation of lane closures, which are necessitated by major roadway construction.

This project is categorized as a Congestion Mitigation/Mobility Investment Strategy because by utilizing probe data in our current traffic management systems, there could be more efficiently scheduled temporary lane closures, which are necessitated by major roadway construction, resulting in less vehicular congestion during major roadway construction projects.

2. TASKS

[Provide a listing of appropriate general tasks divided into phases based on types of work (e.g., laboratory, field) or by year (e.g., year 1, year 2) or other appropriate milestones]

The NJDOT is seeking the insight of proposal responders on how best to achieve the research objectives. Proposers are expected to describe a research effort that can realistically be accomplished as expeditiously as possible. Proposals must present the proposers' current thinking in sufficient detail

to demonstrate their understanding of the problem and the soundness of their approach for conducting the required research.

PHASE I – Literature Search

Conduct a literature search to determine if probe data is being used by anyone to determine expanded or contracted lane closure hours and to document any lessons learned by their experiences. Document whether the traffic management systems they utilized the probe data with is similar to the traffic management system NJDOT currently utilizes.

After the award of the project, a more comprehensive literature search should be conducted. At the completion of this literature search, the Principal Investigator (PI) will make a presentation to the Research Project Selection and Implementation Panel to discuss their findings and to discuss the appropriate research approach.

PHASE II – Research Approach and Anticipated Results

Clear description of how you will solve the problem and implement anticipated findings. Work may be divided into phases (e.g., Laboratory, Field or Year 1, Year 2) as necessary to clarify tasks. *Exit Criteria* must be developed during this phase.

3. IMPLEMENTATION AND TRAINING PLAN

The Principal Investigator (PI) must meet with the Research Project Selection and Implementation Panel (RPSIP) and other NJDOT units to present the findings and as appropriate train these personnel in the use the project results. The Principal Investigator (PI) will develop an implementation plan as per the guidelines provided by NJDOT Research Bureau.

4. DELIVERABLES:

The primary deliverable will be a software model that will analyze lane closures during periods of low historic volume or speed/flow data collected today on all of the interstate highways within NJDOT's jurisdiction. This model should include speed data within the standard volume capacity algorithms to capture the real-time fluctuations for initiating and clearing temporary lane closures.

This model would preferably utilize Microsoft Excel and/or Access, be provided on 10 DVD disks/flash drive/Seagate and would be the intellectual property of NJDOT to operate, maintain and upgrade internally. Model training of NJDOT staff, installation on NJDOT computers, and written instructions on training, installation and upgrading the model would also be included.

Other minimum deliverables necessary to complete this Research Project include, but are not limited to:

- Presentation of Summary of Literature Search Results
- Discussion to Support and Refine the Project Tasks
- Project work plan.
- Technical Memorandum on the survey results
- Technical memorandum on the measures that are working or not working
- Technical memorandum on actions taken
- Interim Status reports suitable for Senior Leadership if required
- Quarterly Reports and Final report with appropriate tables, graphs and charts in hard copy version, PDF file format, Word, and on CD ROM. Two copies plus one per RSIP member of each presentation, technical memorandum, draft final report, and Final Report (10 copies). The draft Final Report Package, in accordance with the latest version of the "Guidelines for Preparing NJDOT Research Final Reports and Tech Briefs" is due to the customers and Research Project Manager (RPM) four (4) months before the end date of the project contract to allow time for

review by the Research Project Selection and Implementation Panel. Final Acceptance will be granted upon receipt of all deliverables including those listed above as well as copies of the approved final report and technical brief.

5. CONTRACT TIME:

Contract time, from Notice to Proceed to acceptance of the Final Report Package, should be no more than **twenty (20) months maximum**, including the submission of the draft final report package four (4) months prior to the end of contract date.

The Principal Investigator (PI) must provide the anticipated research study duration based on the proposed tasks. Consideration should be given to potential impediments so that adjustments are incorporated into the schedule minimizing the need for time extensions. No-cost time extensions require extraordinary circumstances for approval and should not be considered in negotiating the final project time line.

6. CONTACTS:

Upon request, and subject to staff availability, a meeting may be scheduled with interested parties after the RFP's are distributed to refine the objectives and deliverables and to promote a better understanding of the research needs. Questions on this topic **shall not** be directed to any Research Project Manager, Research Customer, or any other NJDOT person. All questions and answers may be addressed during this meeting (if conducted) or through e-mail. Visit the Bureau of Research website for information about the Bureau of Research. Contact Camille Crichton-Summers before November 14, 2011 (Camille.CrichtonSummers@dot.state.nj.us) with RFP related questions or to express your interest in requesting or participating in a pre-proposal meeting.

7. DEADLINE

**Proposals (10 single-bound copies) are due at the NJDOT Bureau of Research
No later than 4:00 PM 12/15/2011**

Authorization to Begin Work: To Be Negotiated.

8. DELIVERY INSTRUCTIONS:

**For private, paid messenger services such as
Federal Express, DHL, UPS, etc., or for hand-carried deliveries:**

2012 PROPOSAL-NJDOT
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